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| 10/573,152      | 03/23/2006  | Behrad Assadian      | 36-1982             | 6586             |

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| EXAMINER |
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BHARADWAJ, KALPANA

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| ART UNIT | PAPER NUMBER |
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2129

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11/28/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

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|------------------------------|--------------------------------------|--|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/573,152 | <b>Applicant(s)</b><br>ASSADIAN ET AL. |  |
|                              | <b>Examiner</b><br>Bharadwaj Kalpana | <b>Art Unit</b><br>2129                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 March 2003.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some    \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Status of Claims*

1. Claims 1-10 are pending.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Choi (USPN 2002/0042793, referred to as **Choi**).

#### **Claim 1, 3, 6, 8 and 10:**

Choi teaches a method for determining the semantic similarity of words in a plurality of words selected from a set of one or more documents, for use in the retrieval of information in an information system, comprising the steps of:

(i) for each word of said plurality of words:

(a) identifying, in documents of said set of one or more documents (**Choi**, ¶ 0002: relevant documents), word sequences comprising the word and a predetermined number of other words (**Choi**, ¶ 0002: query words);

(b) calculating a relative frequency of occurrence for each distinct word sequence among word sequences containing the word (**Choi**, ¶ 0027: search and frequencies of the keywords); and

(c) generating a fuzzy set comprising, for word sequences containing the word (**Choi**, ¶ 0143: Clustering method includes k-nearest neighbor method), corresponding fuzzy membership values calculated from the relative frequencies determined at step (b) (**Choi**, ¶ 0143: fuzzy method); and

(ii) calculating and storing (**Choi**, Fig 4: Mutual Information Volume DB), for each pair of words of said plurality of words, using respective fuzzy sets generated at step (i), a probability that the first word of the pair is semantically suitable (**Choi**, ¶ 0002: degree of semantic similarity) as a replacement for the second word of the pair (**Choi**, ¶ 0143: statistical similarity).

Choi teaches the additional limitations of **Claim 3, 6 and 8**:

an input for receiving a search query (**Choi**, ¶ 0004: query words given by a user);

generating means for generating a set of probabilities indicative of the semantic similarity of words selected from said set of one or more documents (**Choi**, ¶ 0002: semantic similarity) ;

query enhancement means for modifying a received search query with reference, in use, to said generated set of probabilities (**Choi**, ¶ 0009: probability model); and

information retrieval means (**Choi**, ¶ 0008: information retrieval system) for searching said set of one or more documents for relevant information using a received

search query modified by said query enhancement means (**Choi**, ¶ 0089: enhanced efficiency of search).

Choi also teaches the added limitation of Claim 8: Generating in the form of a matrix (**Choi**, ¶ 0106: cluster variables (entropy) results in a matrix of NXP).

**EN:** Although claims 1, 3, 6, 8 and 10 have certain syntactic differences, they are substantially similar in content, and hence the same rejections apply. They have been grouped for brevity.

**Claims 2, 5, 7:**

Choi teaches a method according to claim 1, further comprising the step of:

(iii) adding a new document to said set of one or more documents (**Choi**, ¶ 0171: new data ... is input) and, using a set of words selected from said new document, performing an incremental update (**Choi**, ¶ 0166: update connection strength) to said stored probabilities by means of steps (i) and (ii) performed in respect of said selected words using word sequences identified in said new document (**Choi**, ¶ 0171: produce a completely new class; **EN:** a 'new class' implies performing steps (i) and (ii) with respect to new word sequences).

**Claim 4:**

Choi teaches an information retrieval apparatus according to claim 3, wherein said query enhancement means are arranged to identify, with reference to said

generated set of probabilities, a word having a similar meaning to a term of said received search query and to modify said search query using said identified word (Choi, ¶ 0087: probability distribution of data).

**Claim 8:**

8. An information processing apparatus for use in an information processing apparatus, for use in an information system, for identifying information sets associated with a predetermined information category, the apparatus comprising: generating means for generating, in the form of a matrix, a set of probabilities indicative of the semantic similarity of words selected from a sample set of one or more documents representative of the predetermined information category; calculating means arranged to calculate, for each information set, a vector of values representing the relative frequency of occurrence, in the information set, of words represented in a matrix generated by the generating means; and clustering means arranged to determine a measure of mutual similarity between pairs of information sets, using the respectively calculated vectors and the generated matrix, and to use the determined measures in a clustering algorithm to select one or more information sets to associate with the predetermined information category, wherein said generating means are arranged, in use: (i) for each word selected from said sample set: (a) to identify, in documents of said sample set, word sequences comprising the word and a predetermined number of other words; (b) to calculate a relative

frequency of occurrence for each distinct word sequence among word sequences containing the word; and (c) to generate a fuzzy set comprising, for groups of word sequences containing the word, corresponding fuzzy membership values calculated from the relative frequencies determined at step (b); and (ii) to calculate, for each pair of words of said plurality of words, using respective fuzzy sets generated at step (i), a probability that the first word of the pair is semantically suitable as a replacement for the second word of the pair.

**Claim 9:**

Choi teaches an information processing apparatus according to claim 8, wherein the clustering algorithm is a hierarchic agglomerative clustering algorithm (**Choi, ¶ 0035**: hierarchical clustering for a statistical similarity).

**Examinations Considerations**

1. Examiner's Notes (**EN**) are provided with the cited references to prior art to assist the applicant to better understand the nature of the prior art, application of such prior art and, as appropriate, to further indicate other prior art that maybe applied in other office actions. Such comments are entirely consistent with the intent and spirit of compact prosecution. However, and unless otherwise stated, the Examiner's Notes are not prior

art but a link to prior art that one of ordinary skill in the art would find inherently appropriate.

2. Examiner has cited particular columns and line numbers (or paragraphs) in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the Applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner. The entire reference is considered to provide disclosure relating to the claimed invention.

### ***Conclusion***

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Little, USPN 2002/0059220 cited for a search engine with matching based on a fuzzy logic.

4. Claims 1-10 are rejected.



***Correspondence Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bharadwaj Kalpana whose telephone number is (571) 270-1641. The examiner can normally be reached on Monday-Friday 7:30am 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Vincent can be reached on (571) 272-3080. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KB  
Nov 06, 2007

  
DAVID VINCENT  
SUPERVISORY PATENT EXAMINER